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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 4787E

Issued NOV 1971
Revised MAY 1999

Superseding AMS 4787D

Submitted for recognition as an American National Standard

Gold-Nickel Alloy, Brazing Filler Metal, High Temperature
82Au - 18Ni
1740 °F (949 °C) Solidus-Liquidus Temperature

UNS P00820

1. SCOPE:

1.1 Form:

This specification covers a gold-nickel alloy in the form of wire, rod, sheet, strip, foil, pig, powder, shot, chips, preforms and a viscous mixture (paste) of the powder in a suitable binder.

1.2 Application:

This filler metal has been used typically for joining corrosion and heat resistant steels and alloys where corrosion and oxidation resistant joints with good strength up to 1300 °F (704 °C), but usage is not limited to such application. This filler metal is normally used for brazing, without flux, using a protective atmosphere.

1.3 Classifications:

Filler metal supplied to this specification is classified as follows:

Class 1 Standard composition
Class 2 Supplementary composition control

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

QUESTIONS REGARDING THIS DOCUMENT: (724) 772-7161 FAX: (724) 776-0243
TO PLACE A DOCUMENT ORDER: (724) 776-4970 FAX: (724) 776-0790
SAE WEB ADDRESS: http://www.sae.org

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2222 Tolerances, Copper and Copper Alloy Sheet, Strip, and Plate
MAM 2222 Tolerances, Metric, Copper and Copper Alloy Sheet, Strip, and Plate
AMS 2224 Tolerances, Copper and Copper Alloy Wire
MAM 2224 Tolerances, Metric, Copper and Copper Alloy Wire

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM B 214 Sieve Analysis of Granular Metal Powders

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

Shall conform to the percentages by weight shown in Table 1, determined by spectrochemical methods or other analytical methods acceptable to purchaser (See 8.6).

TABLE 1 - Composition

Element	min	max
Gold	81.50	82.50
Nickel	17.50	18.50
Other Elements, total (3.1.1)	-	0.15

3.1.1 Determination not required for routine acceptance.

3.1.2 For Class 2, copper shall be limited to 0.06% maximum, carbon to 0.005% maximum, and the following elements shall be limited to 0.002% maximum each; aluminum, cadmium, lead, magnesium, phosphorus, silicon, titanium, and zinc. The total of these elements shall not exceed 0.05% maximum.

3.2 Condition:

The product shall be supplied in the following condition:

3.2.1 Wire: Clean and bright. Annealed, unless otherwise specified.

3.2.2 Rod: As fabricated and cleaned.

3.2.3 Sheet, Strip, and Foil: Cold rolled, hard.

3.2.4 Pig, Powder, Shot, and Chips: As fabricated.

3.2.5 Paste: Unless otherwise specified by the purchaser, shall consist of 84 to 90% by weight powder in a suitable binder and shall not contain flux.

3.2.6 Preforms: As fabricated.

3.3 Properties:

Filler metal shall conform to the following requirements:

3.3.1 Color: Shall be as follows:

3.3.1.1 Wire, Rod, Sheet, Strip, and Pig: Gold to yellow-white.

3.3.1.2 Powder, Shot, and Chips: Nickel gray.

3.3.2 Flatness: When unrolled, strip and foil shall lie flat with no undue tendency to recoil.

3.3.3 Paste:

3.3.3.1 Paste shall have a shelf life of not less than six months from date of manufacture; not more than thorough mixing shall be required to restore paste for use during that time.

3.3.3.2 Paste without flux shall leave no adherent residue when heated in a protective atmosphere to a temperature higher than 1000 °F (538 °C).

3.4 Quality:

The product, as received by purchaser, shall be uniform in color, quality, and condition and free from foreign materials and from imperfections detrimental to its working qualities. Wire, rod, sheet, strip, and foil shall be clean, sound, bright, and free from slivers, splitting, ragged edges, damaged ends, and other injurious imperfections. Pig, powder, shot, and chips shall have a metallic luster.

3.5 Sizes and Tolerances:

The product shall be supplied in the following standard sizes and to the tolerances shown:

3.5.1 Wire and Rod:

3.5.1.1 Nominal Diameters: Shall be as shown in Table 2.

TABLE 2 - Standard Diameter Sizes

Inch	Millimeters
0.005	0.13
0.007	0.18
0.010	0.25
0.015	0.38
0.025	0.64
0.031	0.79
0.040	1.02
0.047	1.19
0.062	1.57
0.094	2.39
0.125	3.18
0.175	4.44
0.188	4.78
0.225	5.72
0.250	6.35

3.5.1.2 Diameter Tolerances for Drawn Wire and Rod: AMS 2224 or MAM 2224 as applicable to refractory alloys.

3.5.1.3 Diameter Tolerances for Rolled or Extruded Wire and Rod: Shall be as shown in Table 3.

TABLE 3A - Diameter Tolerances, Inch/Pound Units

Nominal Diameter or Distance Between Parallel Sides Inch	Tolerances, Inch Plus and Minus Rounds	Tolerances, Inch Plus and Minus Squares
0.031 to 0.062, incl	0.005	0.008
Over 0.062 to 0.125, incl	0.006	0.009
Over 0.125 to 0.188, incl	0.007	0.009
Over 0.188 to 0.250, incl	0.008	0.010

TABLE 3B - Diameter Tolerances, SI Units

Nominal Diameter or Distance Between Parallel Sides Millimeters	Tolerances, Millimeter Plus and Minus Rounds	Tolerances, Millimeter Plus and Minus Squares
0.79 to 1.57, incl	0.13	0.20
Over 1.57 to 3.18, incl	0.15	0.23
Over 3.18 to 4.78, incl	0.18	0.23
Over 4.78 to 6.35, incl	0.20	0.25

3.5.2 Sheet, Strip, and Foil:

3.5.2.1 Nominal Thicknesses: Shall be as shown in Table 4.

TABLE 4 - Standard Thicknesses

Inch	Millimeters
0.001	0.025
0.0015	0.038
0.002	0.05
0.003	0.08
0.004	0.10
0.005	0.13
0.006	0.15
0.008	0.20
0.010	0.25
0.014	0.36
0.020	0.51
0.030	0.76

3.5.2.2 Tolerances:

3.5.2.2.1 Thickness: Nominal thicknesses under 0.002 inch (0.05 mm) shall have a tolerance of ±0.0002 inch (±5 µm); nominal thicknesses 0.002 inch (0.05 mm) and over shall have tolerances conforming to AMS 2222 or MAM 2222 as applicable to refractory alloys.

3.5.2.2.2 Width of Individual Rolls: Nominal widths under 6 inches (152 mm) shall vary not more than ±0.010 inch (±0.25 mm) from the width ordered. Nominal widths 6 inches (152 mm) and over shall vary not more than ±0.015 inch (±0.38 mm) from the width ordered.

3.5.2.2.3 Length in Individual Roll: Shall not be limited except that no roll shall weigh more than 75 pounds (34 kg).

3.5.3 Powder:

3.5.3.1 Mesh Designations: 60, 100, 140, 200, and 325.

3.5.3.2 Powder shall be supplied in accordance with the limits on particle size distribution shown in Table 5, unless some other distribution is specified. Tests shall be in accordance with ASTM B 214.

TABLE 5 - Particle Size Distribution

Mesh Designation	U.S. Standard Sieve
60	Through a No. 40 sieve - 100% Through a No. 60 sieve - 95% minimum Through a No. 325 sieve - 10% maximum
100	Through a No. 60 sieve - 100% Through a No. 100 sieve - 95% minimum Through a No. 325 sieve - 15% maximum
140C	On a No. 100 sieve - 0.5% maximum On a No. 140 sieve - 10% maximum Through a No. 325 sieve - 20% maximum
140F	On a No. 100 sieve - 0.5% maximum On a No. 140 sieve - 10% maximum Through a No. 325 sieve - 55% maximum
200	On a No. 140 sieve - 0.5% maximum On a No. 200 sieve - 10% maximum Through a No. 325 sieve - 65% maximum
325	On a No. 200 sieve - 0.5% maximum On a No. 325 sieve - 10% maximum Through a No. 325 sieve - 90% maximum

3.5.3.2.1 When a mesh designation is not specified, 140F mesh shall be supplied.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of the product shall supply all samples for vendor's tests and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to specified requirements.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: All technical requirements, other than shelf life of paste (3.3.3.1), are acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests: Shelf life of paste (3.3.3.1) is a periodic test and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.